🔹 1. SQL Server Maintenance Tasks

**✅ Automated Backups & Recovery**

* **Full, Differential, and Transaction Log Backups** using SQL Agent Jobs or PowerShell.
* Automate **backup verification (RESTORE VERIFYONLY)** to ensure backups are valid.
* Automate **point-in-time recovery** for disaster recovery (DR) plans.

**✅ Index Maintenance & Optimization**

* Automate **index fragmentation detection & rebuilding**.
* Automate **statistics updates** to improve query performance.

(Use **SQL Agent Jobs** to schedule this automatically.)

**✅ Database Integrity Checks (DBCC CHECKDB)**

* Automate **DBCC CHECKDB** to detect database corruption.
* Generate alerts for **corruption detection**.

DBCC CHECKDB('YourDatabase') WITH NO\_INFOMSGS, ALL\_ERRORMSGS;

**✅ Automated Database Growth Monitoring**

* Monitor database **file size** and **autogrowth settings**.
* Send alerts when **disk space is low**.

**🔹 2. Performance Tuning & Monitoring**

**✅ Query Performance Monitoring**

* Use **SQL Profiler or Extended Events** to track slow queries.
* Automate detection of **expensive queries** and index suggestions.

SELECT TOP 5 total\_worker\_time/execution\_count AS AvgCPUTime, text

FROM sys.dm\_exec\_query\_stats AS qs

CROSS APPLY sys.dm\_exec\_sql\_text(qs.sql\_handle) AS st

ORDER BY AvgCPUTime DESC;

**✅ Automated Blocking & Deadlock Detection**

* Detect and resolve **deadlocks** using SQL Server Extended Events.
* Send alerts via **email/SMS when blocking exceeds a threshold**.

SELECT blocking\_session\_id AS BlockingSession, wait\_type, wait\_time

FROM sys.dm\_exec\_requests

WHERE blocking\_session\_id IS NOT NULL;

**✅ Monitor and Tune TempDB Usage**

* Automate **TempDB growth monitoring** and performance tuning.

SELECT file\_id, name, size/128 AS SizeMB, max\_size/128 AS MaxSizeMB FROM tempdb.sys.database\_files;

**🔹 3. Security & Compliance**

**✅ Automate User Auditing & Access Reviews**

* Track **failed login attempts** and **unauthorized access**.
* Automate **user permissions review**.

SELECT event\_time, login\_name, host\_name, database\_name, state\_desc

FROM sys.fn\_get\_audit\_file('C:\SQL\_Audit\\*.sqlaudit', DEFAULT, DEFAULT)

WHERE state\_desc = 'FAILED\_LOGIN';

**✅ Automate Patching & Vulnerability Assessments**

* Use **Azure Defender for SQL** to automate vulnerability scanning.
* Automate **SQL Server patching** using **WSUS or PowerShell**.

Get-HotFix | Where-Object { $\_.Description -match "SQL" }

**🔹 4. High Availability & Disaster Recovery**

**✅ Automate Always On Availability Groups Failover**

* Automate **automatic failover testing** for High Availability (HA).

SELECT ag.name, replica\_id, role\_desc FROM sys.availability\_groups ag

JOIN sys.dm\_hadr\_availability\_replica\_states ars ON ag.group\_id = ars.group\_id;

**✅ Automate Log Shipping Monitoring**

* Monitor **log shipping status** and **restore failures**.

EXEC sp\_help\_log\_shipping\_monitor;

**🔹 5. Azure SQL & Cloud Automation**

**✅ Automate Azure SQL Backups**

* Use **Azure Automation Runbooks** to schedule backups.
* Automate **long-term retention policies**.

az sql db export --resource-group MyResourceGroup --server MyServer --name MyDatabase --storage-key MyKey

**✅ Automate Scaling of Azure SQL Databases**

* Use **Azure Elastic Jobs** to scale up/down based on load.

az sql db update --name MyDatabase --service-objective S3

**🔹 6. AI & Machine Learning for SQL DBA Tasks**

**✅ AI-Powered Performance Tuning**

* Use **Azure AI anomaly detection** to detect query performance issues.

from azure.ai.anomalydetector import AnomalyDetectorClient

response = client.detect\_last\_point(series=your\_query\_stats)

if response.is\_anomaly:

print("Potential Performance Issue Detected!")

**✅ AI-Based Predictive Maintenance**

* Use **machine learning models** to predict **database failures**.
* **Proactively adjust resources** to prevent slowdowns.